

Title (en)
SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING THE SAME

Title (de)
HALBLEITERBAUELEMENT UND VERFAHREN ZUR HERSTELLUNG DAVON

Title (fr)
DISPOSITIF SEMICONDUCTEUR ET SON PROCÉDÉ DE FABRICATION

Publication
EP 4199688 A1 20230621 (EN)

Application
EP 22187027 A 20220726

Priority
CN 202111542882 A 20211216

Abstract (en)
A method for fabricating semiconductor device includes the steps of providing a substrate having a magnetic random access memory (MRAM) region (14) and a logic region (16), forming an inter-metal dielectric (IMD) layer (30) on the substrate, forming at least two metal interconnections (32) in the IMD layer on the MRAM region, forming a spin orbit torque (SOT) layer (38) on the metal interconnections, forming a magnetic tunneling junction (MTJ) stack on the SOT layer, forming a hard mask (42) on the MTJ stack, using the hard mask to pattern the MTJ stack for forming the MTJ (48), forming the cap layer (50) on the SOT layer and the hard mask, and patterning the cap layer and the SOT layer.

IPC 8 full level
H10N 50/01 (2023.01); **H10N 50/10** (2023.01); **H10N 50/80** (2023.01); **H10B 61/00** (2023.01)

CPC (source: EP US)
H10B 61/00 (2023.02 - US); **H10N 50/01** (2023.02 - EP); **H10N 50/10** (2023.02 - EP); **H10N 50/80** (2023.02 - EP); **H10N 52/00** (2023.02 - US); **H10N 52/01** (2023.02 - US); **H10N 52/80** (2023.02 - US); **H10B 61/00** (2023.02 - EP)

Citation (search report)

- [XY] US 2020235288 A1 20200723 - IKEGAWA SUMIO [US], et al
- [X] US 2021367143 A1 20211125 - LEE CHIEN-MIN [TW], et al
- [X] US 2021359199 A1 20211118 - LIN SHY-JAY [TW], et al
- [YA] US 2021066579 A1 20210304 - WANG HUI-LIN [TW], et al
- [Y] US 2020075670 A1 20200305 - LIN SHY-JAY [TW], et al

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

Designated validation state (EPC)
KH MA MD TN

DOCDB simple family (publication)
EP 4199688 A1 20230621; CN 116267013 A 20230620; TW 202329494 A 20230716; US 2023200258 A1 20230622

DOCDB simple family (application)
EP 22187027 A 20220726; CN 202111542882 A 20211216; TW 111130250 A 20220811; US 202217574569 A 20220113